Mr. Maskelyne, for whom he was right-hand man, and almost sole working helper during upwards of twenty years, looks back with fond regret on the uninterrupted happiness of their association. According to my own experience of the last fifteen years, he was an excellent colleague, always cheerful, good-tempered, and kind-hearted, ever ready to help in any direction, however much it might interfere with the particular work he had immediately in hand. At home he was an enthusiastic gardener; wet or fine, absolutely reckless of weather, he was at work from early sunrise, and could boast the possession of one of the best managed gardens in the neighbourhood. His love of fresh air and the bustling east wind never left him; even after recovery from the long illness which two years ago had taken him to the verge of the grave, he did not hesitate to show the greatest contempt for the protection of an umbrella, and notwithstanding the remonstrances of his friends, might still be occasionally seen enjoying the beating of the wind and rain on his unprotected face.

He was an Original Member of the Mineralogical Society, and Foreign Secretary for several years preceding his death.

Mr. Davies leaves a widow and nine children to mourn his loss. L. FLETCHER.

NOTES.

AT the last meeting of the Council of the Mineralogical Society, it was resolved to initiate a "Thomas Davies Memorial Fund" on behalf of the widow and children of the late Mr. Thomas Davies, F.G.S., of the British Museum. The following gentlemen have consented to act as an Executive Committee:—Prof. N. S. Maskelyne, F.R.S. (chairman), Dr. Hugo Müller, F.R.S. (treasurer), Mr. H. A. Miers, F.G.S. (secretary), Prof. T. G. Bonney, F.R.S., Mr. L. Fletcher, F.R.S., Dr. Henry Hicks, F.R.S., W. H. Hudleston, F.R.S., Prof. J. W. Judd, F.R.S., Mr. F. W. Rudler, F.G.S., Mr. F. Rutley, F.G.S., Rev. Prof. T. Wiltshire, F.G.S., Dr. Henry Woodward, F.R.S. Subscriptions for the fund should be sent to Dr. Hugo Müller, 13 Park Square East, Regent's Park, London, N.W.

AN extra meeting of the Chemical Society will be held on February 20, at 8 p.m., the anniversary of the death of Herman Kopp, when a lecture will be delivered by Prof. T. E. Thorpe, F.R.S. Lord Playfair will be in the chair.

AN International Botanical Congress is to be held during the Columbian Exposition at Chicago. Prof. C. E. Bessey will receive communications on the subject.

M. P. DUCHARTIE has been elected president, and M. L. Guignard first vice-president, of the Botanical Society of France for the year 1893.

THE annual public meeting of the University College Chemical and Physical Society will be held at University College, Gower Street, on Friday, February 24. The chair will be taken at eight o'clock by Prof. F. T. Roberts, and Prof. Watson-Smith will deliver an address on diseases incident to work-people in chemical and other industries.

MR. THOMAS BRYANT, president of the Royal College of Surgeons, delivered the Hunterian oration on Tuesday afternoon in the theatre of the college, in the presence of the Prince of Wales and the Duke of York and a large and distinguished company. Mr. Bryant began by thanking their Royal Highnesses for their presence on the special occasion of the centenary of the death of John Hunter, the great founder of scientific surgery. In the course of his oration Mr. Bryant said that the whole world of vegetable and animal life was Hunter's subject, but that his main objects were the improvement of surgery by the elucidation of pathology; the examination of the causes which determine any departure from the normal type, whether of form or function; and the study of the means which nature adopts for the healing of wounds and the repair of injuries. It was one of his special merits that he raised surgery out of the position of a a poor art, based on empirical knowledge and practised too much as a trade, to establish it firmly as a high and elevating science, at the same time raising its practitioners in the social scale, and doing as much for medicine as for surgery, for he considered them inseparable. He made the profession scientific by basing it upon the widest knowledge of the structure and functions of all living things, and educed therefrom laws and principles for the guidance of future generations in their study and treatment of disease in any of its forms. This alone should render him worthy of the thanks of civilised mankind.

MR. GEORGE MATHEWS WHIPPLE, whose death we briefly recorded last week, had done much solid and valuable work in various departments of physical science. Among the subjects in which he was especially interested were wind force and wind velocities, and throughout the greater part of his life, as the *Times* has said in a brief sketch of his career, he was constantly carrying on experiments with a view to determine wind force and to find out what were the best instruments for securing accurate results. He improved the Kew pattern magnetic instruments; he designed, among other instruments, the apparatus for testing the dark shades of sextants; and at various periods he was associated with Captain Heaviside, Major Herschel, and General Walker, in carrying on pendulum experiments for the determination of the force of gravity. The magnetic part of the report of the committee appointed by the Royal Society to investigate the Krakatoa eruption and the subsequent phenomena was prepared by Mr. Whipple, and valuable papers were from time to time submitted by him to the Royal Society and the Royal Meteorological Society. He was fifty years of age at the time of his death. He entered the Kew Observatory in 1858, became magnetic assistant in 1862, and was appointed superintendent in 1876. This office is one of great and growing importance, and we trust that a capable successor may be found. The Kew Observatory is the central standardising station of the Meteorological Office, and numerous magnetical observatories in other countries are similarly connected with it. New instruments are tested there, and experiments are made, and it has now grown into an institution where the verification of scientific instruments of many kinds, including thermometers, sextants, telescopes, watches, and recently photographic lenses, is carried on on a large scale, as described in the annual report of the Kew committee to the Royal Society.

THE Rev. F. O. Morris died at Nunburnholme, in Yorkshire, on Friday last, at the age of eighty-two. He was well-known as a popular writer on science, and did much to create and foster interest in some branches of natural history, especially in ornithology. Among his many books were "A History of British Birds," issued in six volumes from 1851 to 1857, and his "Natural History of the Nests and Eggs of British Birds," published in three volumes in 1853. In 1854 he was presented to the rectory of Nunburnholme, which he continued to hold until his death.

A DESTRUCTIVE earthquake has taken place in the island of Samothrace. All the buildings are said to have been destroyed. Renewed shocks, accompanied by loud subterranean rumblings, have also occurred at Zante.

ON Sunday a shock of earthquake was experienced in New Zealand. It caused little damage, but was felt in both the North and South Islands, being most severe at Wellington and at Nelson.

The weather of the past week has been very stormy and damp in most parts of these islands; scarcely a day has passed without gales being reported. On Friday, the 10th, the wind force was especially strong, on the north-east coast of Scotland and in the English Channel, and on Tuesday another deep depression had reached our northern coasts from off the Atlantic, accompanied by strong gales. The United Kingdom was situated between two areas of high barometer readings, one of which lay over Scandinavia and the other over France and Spain. With this distribution of pressure, the conditions were favourable to the passage of cyclonic disturbances within our area, and although the storms were not of exceptional violence in the southern districts, they were so relatively, as the winds have been peculiarly quiet during the last twelve months. Temperature has been a little above the mean for the season, the daily maxima often exceeding 50°, but on Sunday the highest day readings were below 40° over the north-east of England, while a sharp frost occurred in the north of Scotland, the minimum temperature registering 20°. On the continent the temperature has been much lower than in this country; at Haparanda, at the north of the Gulf of Bothnia, which lies in the area of the high barometric pressure over Scandinavia, a temperature of minus 37° was recorded on Friday and Saturday. Rainfall has been of daily occurrence at most stations, although the amounts measured have generally been light, while hail and sleet have occurred in many places. With Tuesday's storm, however, the rainfall exceeded an inch on the west coasts of Ireland and Scotland. By the *Weekly Weather Report* of the 11th instant it appears that the rainfall for that week was greatly in excess of the mean in the north and west of Scotland, and to a less extent in the east of Scotland, the north of Ireland, and the western parts of England. Bright sunshine exceeded the mean in all districts, the greatest amounts, 32 to 38 per cent., being recorded in most parts of England.

The recent numbers of *Ciel et Terre* (Nos 21–23) contain interesting articles on ozone. The observation of this element by meteorologists has been almost given up in most countries, owing chiefly to the difficulty of obtaining comparable results by the methods at present in use, although its importance for invalids and others as a purifier of the atmosphere is generally acknowledged. And at a recent meeting of the Royal Meteorological Society, regret was expressed at the discontinuance of these observations. D. A. Van Bastelaer, in conjunction with the Royal Observatory of Brussels, maintained a system of ozone observations at 150 of the stations belonging to the Society of Public Medicine in Belgium during the years 1886–91, which is probably the most complete investigation into the subject which has been made. The values found for the various stations are given in a tabular form, and M. Van Bastelaer found that there are continual and sudden variations in the records from hour to hour, between morning and evening, and from one day to another, but that the mean values for any locality remain nearly constant. Isolated values are of no use; a long series of observations is necessary for any results of importance to be arrived at. The air at stations near the sea coast contained, as is usually supposed, the greatest amount of ozone.

The Indiana Academy of Science lately held at Indianopolis its eighth annual meeting, the president being Prof. J. L. Campbell, of Wabash College, Crawfordsville, Ind. There was a large attendance, and no fewer than ninety-two papers had been prepared, most of which were read. The first volume of the Academy's Proceedings was distributed at the meeting.

The *Kew Bulletin* continues, in the January number, its series of articles on the food grains of India, one of the subjects being Kangra Buckwheat (*Fagopyrum tataricum*, Gærtn., var. *himalaica*, Batalin). The typical plant is cultivated throughout the higher Himalayas, but more especially on the western extremity, and at altitudes from 8000 to 14,000 feet. The yield in India cannot yet be estimated, but the *Bulletin* says there can be little doubt that the seeds are singularly rich in nutrient constituents. This is confirmed by the conclusions of Prof. Church with regard to a sample he has examined.

The January number of the *Kew Bulletin* contains also the fourth decade of new orchids, the fourth of "Decades Kewenses," papers on fruit growing at the Cape and the clove industry of Zanzibar, and miscellaneous notes.

Prof. R. Shimek is now investigating the flora and the geology of Nicaragua, along the route of the canal, under commission from the State University of Iowa. Dr. Terracciano, of Rome, is about to renew his investigation of the flora of Erythrea, the Italian colony on the Red Sea. Dr. K. N. Denkenbach is commissioned by the Natural History Society of St. Petersburg to investigate the flora of the Black Sea.

Mr. R. Thaxter proposes in the *Botanical Gazette* the establishment of a new order of Schizomycetes, the Myxobacteriaceæ, somewhat intermediate in its characters between the typical Schizomycetes and the Myxomycetes. It comprises the genus Chondromyces, placed by Berkeley, in his "Introduction to Cryptogamic Botany," under the Stilbacei, and two new genera, Myxobacter and Myxococcus. The order consists of mobile rod-like organisms, multiplying by fission, secreting a gelatinous base, and forming pseudo-plasmode-like aggregations before passing into a more or less highly-developed cyst-producing resting state, in which the rods may become encysted in groups without modification, or may be converted into spore-masses.

At the meeting of the Royal Botanic Society on Saturday, one of the branches of the flowering stalk of *Fourcroya selloa* was shown from the Society's conservatory. This is a Mexican plant allied to the aloes, and like them it flowers only once during its life. The plant, which has been in the conservatory for upwards of twenty years, late last autumn threw up a flower spike which in a very short time grew to a height of 30 feet, and, passing through the glass roof, rose for some feet into the open air. It could not, of course, resist the frosts and fogs of winter. The flower-buds dropped unopened, when immediately from each node a number of young plants appeared. This mode of reproduction is found in only a few varieties of plants, and is especially valuable in relation to the cultivation of Fourcroyas as a source of commercial vegetable fibre.

The Newcastle Literary and Philosophical Society will have no very pleasant associations with the memory of its hundredth anniversary, which was celebrated on Tuesday of last week. During the following night the society's premises caught fire and were greatly damaged. Much injury was done to the library, where many most valuable books were destroyed.

The fifth and sixth parts of the fifth volume of the *Internationales Archiv für Ethnographie* have been issued together in a single number. It includes the second part of Dr. W. Svoboda's interesting study (in German) of the inhabitants of the Nicobar Islands; a paper (in French) by Desiré Pector on the volume by Dr. Hyades and Dr. Deniker (noticed some time ago in Nature) on the ethnography of a part of Tierra del Fuego; a suggestive essay (in German) by Dr. T. Achelis, on the psychological importance of ethnology; and the second part of Dr. Schmeltz's careful contributions (in German) to the ethnography of Borneo. The first and last of these papers are admirably illustrated. A valuable paper on the Ainos, by David MacRitchie, of Edinburgh, has been published as a supplement to the fourth volume of the *Archiv*. This paper is accompanied by, and contains full descriptions of, a series of coloured reproductions of most interesting pictures of Aino life by Japanese artists, who have naturally a keener perception of the characteristics of their savage neighbours than can be attained by Western visitors. Mr. MacRitchie seeks to show that the Ainos display "unmistakable traces of a near descent, by at least one line of their ancestry, from the most crude form of humanity."

MESSRS. SAMSON AND WALLIN, Stockholm, are about to issue what promises to be an important and interesting work, by F. R. Martin, on the Siberian Antiquities of the Bronze Age, preserved in the museum of Minousinsk. Nearly 900 objects in copper and bronze will be represented in the plates, which, according to the prospectus, are being prepared with the greatest care. The antiquities of which these objects are selected specimens were collected in 1874 by M. Nicolaï Martianow from mounds in the steppes of the Upper Yenisei. They are the finest provincial collection in the Russian Empire, and M. Martin found much to interest him in classifying and photographing them. The present volume will be the first of a series of works on the ethnography and archæology of Western Siberia by the same writer.

THE third volume of "A Journal of American Ethnology and Archæology," edited by J. Walter Fewkes, has been issued. It contains an interesting "outline of the documentary history of the Zuñi tribe," by A. F. Bandelier, and "somatological observations on Indians of the south-west," by Dr. H. F. C. Ten Kate. It is worth while to note that in Dr. Ten Kate's opinion the study of physical anthropology among the North American Indians does not tend to demonstrate that their types are exclusively American. It rather shows, he thinks, that they present only the characteristics of "the Mongolian or so-called yellow races." "I do not mean," he says, "that the American aborigines are Mongolians in the strict sense of the word, or that America has been populated from Asia. Where the Indians came from I do not know, but my position is as follows:—The American race is, somatologically speaking, not a type, but has characteristics which can only be called Mongoloid."

PROBABLY no living sportsman has shot more big game in South Africa than Mr. F. C. Selous, who for years was more at home in a waggon or a tent somewhere in the far countries of Africanderland than in the towns and settlements of the Cape Colony or the Transvaal. He has nearly completed an account of eleven years' sport and travel, which will be shortly published by Messrs. Rowland, Ward and Co., of Piccadilly. It will be fully illustrated, and will include a variety of general information on subjects of interest in connection with the latest developments of South African exploration.

MR. ELLIOT STOCK has published the third volume of "The Field Club," a magazine of general natural history for scientific and unscientific readers, edited by the Rev. Theodore Wood. The volume contains many articles which are well fitted to awaken interest in various aspects of natural science.

WE referred lately to Dr. D. G. Brinton's opinion as to the relation between nervous diseases and civilisation. As his view has been called in question by Dr. Rockwell, he returns to the subject in *Science*, supporting his own conclusions by a reference to a paper contributed by Dr. I. C. Rosse, professor of nervous diseases at the Georgia Medical College, to the *Journal of Nervous and Mental Disease* for July, 1891. In this paper Dr Rosse cites many authorities to prove that there is as much nervous disease at low as at higher stages of civilisation, and perhaps more. In the district of Columbia, for example, the decedents among the coloured people from nervous diseases often exceed those of the white population by thirty-three per cent. Dr. Rosse is inclined to believe that a sudden change in the social habits and condition of any race, at any stage of advancement, will result in a prompt development of neurotic disease. A high civilisation, which is stable, excites such a condition less than instability in lower grades.

AT the meeting of the Field Naturalists' Club of Victoria in November a paper presenting a list of species of Victorian butterflies was communicated. It had been prepared by Messrs. F. Spry and Ernest Anderson, and embodied the results of work carried on during many years. The *Victorian Naturalist* says the paper was "received with great satisfaction, and will prove of extreme value to the Victorian lepidopterist."

MR. H. L. CLARK records in *Science* what he calls "a bit of satisfactory evidence" as to the rate of speed in the flight of certain birds. He thinks that this is often greatly exaggerated. He was travelling lately on the Baltimore and Ohio Railway, up the valley of the Potomac, when he saw a great many wild ducks, which are admitted to be among the strongest flyers in America. It so happened that, on rounding a sharp curve, the train flushed a pair of buffle-heads, which started up stream at full speed. On watching them he found that, instead of their leaving the train behind, the train was actually beating them, and he is confident that their rate of speed was not equal to that of the train. "We kept alongside of them," he says, "for nearly a minute before they turned back down-stream. Careful calculation showed that the train was running at about thirty-seven miles per hour, so that the rate of speed for those wild ducks would be about thirty-six. I hope that others may have some evidence on this question of speed in flight which will throw more light on the subject."

AN interesting illustration of the tendency of inorganic matter to simulate the forms seen in organic is afforded by some specimens of hæmatite from a mine in Lake Superior district. It is described in the *American Geologist* as a fibrous red hæmatite, compact and tough-looking, and the radiating filaments or fibres towards their summits are seen to spread out like some frondescent vegetable growths. It would seem that in process of increase these fibres, starting from different but slightly distant points, and having a tendency to expand, soon began to interfere with one another. The line of contact, which became a plane as growth continued, is marked by a more or less distinct plane of separation. This frondescent hæmatite, in addition, is pierced by a number of peculiar channels which seem to date from the time of development of the crystals. It is noticed that these run, in general, perpendicular to the fibrous structure, and lie in or across the planes of contact of two oppositely spreading frondescent growths. These appear to mark in the first instance the vacancies left by the first contacts of overarching growths from opposite directions. These branches then interfered with the free circulation of air, and interrupted and permanently stopped the development of these fibres beneath the overspreading canopy.

IT was shown by Ferraris some time ago (and the fact was of great practical importance) that by means of two simple alternating currents acting in fixed spirals, a rotating magnetic field could be produced, which by inductive action set in rotation a copper cylinder or other conducting body brought into the field. Also an iron cyclinder, cut through so that the Foucault induction currents could not be formed, was rotated by virtue of so-called magnetic hysteresis. Further studies in this direction have been made by Signor Arno, using electric instead of magnetic forces, and a dielectric body instead of a magnetic.

He thus succeeded in rotating a hollow cylinder of mica, or other insulating substance, hung by a silk fibre, in the space enclosed by four vertical curved copper plates, to which the requisite differences of potential were communicated. An account of these interesting experiments (described to the Accademia dei Lincei) will be found in the *Naturwissenschaftliche Rundschau*, No. 3, 1893.

PROF. R. C. SCHIEDT has been making some interesting observations on oysters, and at a recent meeting of the Philadelphia Academy of Natural Sciences Prof. Ryder reported on his behalf that oysters which had the right valve removed and were exposed to the light in this condition, in a living state for a fortnight or so, developed pigment over the whole of the epidermis of the exposed right mantle and on the upper exposed sides of the gills, so that the whole animal from this cause assumed a dark-brown colour. Animals so exposed not only attempted to reproduce the lost valve and hinge, but also partly succeeded in so doing, even re-establishing the insertion of the diminutive pedal muscle upon the inner face of the imperfectly reproduced right valve, which was deformed owing to the lack of support of the right mantle, because of the removal of the original right valve. As a consequence the right mantle was rolled up at the edge, and this deformation of the mantle was reflected in the attempted regeneration of the lost right valve. The pigment developed during exposure to light in the mantle and gills in oysters with the right valve removed, which were kept alive in the aquaria at Sea Isle City by Prof. Schiedt, was wholly confined to the epidermis as it normally is at the mantle border in the unmutilated animal in nature. The inference to be drawn from these facts is that the development of pigment in the mantle and gills was wholly and directly due to the abnormal and general stimulus of light over the exposed surface of the mantle and gills, due to removal of the right valve, and that the mantle border, the only pigmented portion of the animal, is pigmented because it is the only portion of the animal which is normally and constantly subjected to the stimulus of light.

MR. D. CLEVELAND, of San Diego, California, contributes to *Science* an article in which he states some curious facts regarding the trap-door spider (*Mygale henzii*, Girard), which is widely diffused in California. Behind San Diego there are many hillocks about a foot in height and three or four feet in diameter. These hillocks are selected by the spiders, Mr. Cleveland suggests, because they afford excellent drainage and cannot be washed away by the winter rains. A suitable spot, which always consists of clay, adobe or stiff soil, having been chosen, the spider excavates a shaft varying from five to twelve inches in depth, and from one-half to one and a half inches in diameter. This is done by means of the sharp horns at the end of the spider's mandibles, which are its pick and shovel and mining tools. The earth is held between the mandibles and carried to the surface. When the shaft is of the required size, the spider smooths and glazes the wall with a fluid which is secreted by itself. Then the whole shaft is covered with a silken paper lining, spun from the animal's spinnarets. The door at the top of the shaft is made of several alternate layers of silk and earth, and is supplied with an elastic and ingenious hinge, and fits closely in a groove around the rim of the tube. This door simulates the surface on which it lies, and is distinguishable from it only by a careful scrutiny. The spider even glues earth and bits of small plants on the upper side of the trap-door, thus making it closely resemble the surrounding surface. The spider generally stations itself at the bottom of the tube. When, by tapping on the door, or by other means, a gentle vibration is caused, the spider runs to the top of its nest, raises the lid, and looks out and reconnoitres. If a small creature is seen, it is seized and devoured. If the invader is more formidable, the door is quickly closed, seized, and held down by the spider, so that much force is required to open it. Then the spider drops to the bottom of the shaft. When the door of the nest is removed, the spider can renew it five times—never more than that. From forty to fifty cream-coloured spiderlings are hatched from the yellow eggs at the bottom of the nest. When these have attained only a fraction of their full size—before they are half grown—the mother drives them out into the world to shift for themselves. After a brief period of uncertainty they begin active life by making nests, each for itself, generally close to "the old homestead," sometimes within a few inches of it. These nests are always shallow and slender, and are soon outgrown. When the spider attains its full size it constructs a larger nest.

AN interesting paper concerning the supposed volatility of the element manganese is contributed by Prof. Lorenz and Dr. Heusler, of Göttingen, to the current number of the *Zeitschrift für Anorganische Chemie*. Although the melting point of the metal is known with tolerable certainty to be about 1800° – 1900°, much higher than that of iron, no information has yet been acquired concerning its boiling point. Profs. Lockyer and Chandler Roberts, however, so long ago as 1875 pointed out that the metal was volatile at the temperature of the oxy-hydrogen blowpipe; and M. Jordan, in a communication to the *Comptes Rendus* in the year 1878, reported that in the manufacture of highly manganiferous spiegeleisen near Marseilles, a deposit very rich in manganese was usually found in the cooler portions of the furnace. Moreover, M. Jordan stated that during the casting of ferro-manganese red flames are produced, from which a heavy fume is deposited containing a large percentage of manganese. M. Jordan subsequently heated ferro-manganese to a white heat in a crucible in his laboratory, and ascertained that a diminution in the percentage of manganese actually occurred. These observations were considered somewhat surprising, inasmuch as the melting point of manganese is so high, in the neighbourhood of white heat, and it would appear that this volatility must be exhibited even at the melting point itself.

PROF. LORENZ and his colleague have therefore conducted a series of experiments with the view of ascertaining whether manganese is really volatile *per se*, or whether the volatility is due to the intermediate action of carbon monoxide (derived from the carbon usually present) in forming a volatile but dissociable compound of a nature similar to nickel- and iron-carbonyl. It was first definitely proved that carbon monoxide does not combine with manganese below the temperature of 350°, a fact which M. Guntz has recently independently pointed out. Experiments were then made at higher temperatures, using a new form of combustion furnace, designed by Prof. Lorenz and fully described in the *Zeitschrift*, in which each individual burner is supplied with a blast capable of being regulated, the whole apparatus being equivalent to a row of blowpipes which will rapidly raise a thick porcelain tube up to a white heat. In the first series of these high temperature experiments coarsely powdered manganese containing seven per cent. of carbon was heated to whiteness in a glazed porcelain tube in a current of carbon dioxide, in order that nascent carbon monoxide might be produced in contact with manganese by the reduction of the carbon dioxide by the carbon present. After half-an-hour's heating the tube was allowed to cool in the stream of carbon dioxide and then broken, when it was found that a large quantity of the manganese had volatilised and condensed again further along the tube, in the form of a thick black deposit somewhat resembling zinc dust. Upon repeating the experiment with a current of carbon monoxide, a similar result was obtained. Hence manganese is certainly volatile in carbon monoxide. But it was afterwards found that equally good deposits of manganese dust were obtained when a current of either hydrogen or nitrogen, neither of which combine with manganese, were employed. It is therefore evident that manganese does not resemble iron and nickel in forming a volatile compound with carbon monoxide, but that the volatility is a property of the element itself, and is singularly manifested even at the temperature of the melting point.

SOME of the more interesting captures recently made by the dredging staff of the Marine Biological Association at Plymouth are the Actinian *Chitonactis coronata;* the Nudibranchs *Berghia cærulescens* (new to Britain), *Amphorina cærulea*, and *Lamellidoris oblonga* in considerable numbers; and the handsomely marked rare spider-crab, *Stenorhynchus egyptius.* The alga *Halosphæra viridis* has been present in all townettings since October; and *Noctiluca*, though in small numbers, is now generally present. The breeding season of a large number of Invertebrata has already commenced, and the sea swarms with Copepod and Cirrhipede Nauplii, and with Polychæte larvæ. Species of the following genera are breeding:—The Hydroids *Halecium, Plumularia, Sertularella, Hydrallmania;* the Actinians *Chitonactis* and *Actinia;* the Nemertine *Lineus obscurus* (larva of Desor); *Phyllodoce maculata* and other Annelids; the Molluscs *Capulus hungaricus, Lamellaria, Buccinum, Purpura,* many Nudibranchs; and the Decapod Crustacea *Crangon, Pandalus,* and *Palæmon; Carcinus, Cancer,* and *Eurynome.*

THE additions to the Zoological Society's Gardens during the past week include a Fallow Deer (*Dama vulgaris* ♂) European, presented by Mr. B. L. Rose; a Great Eagle Owl (*Bubo maximus*) European, presented by Mr. Adolphus Drucker; two Gold Pheasants (*Thaumalea picta* ♀ ♀) from China, presented by Miss Forster; nine Snow Buntings (*Plectrophanes nivalis*) British, presented by Mr. T. E. Gunn; an Egyptian Cobra (*Naia haje*), two Hoary Snakes (*Coronella cana*), from Victoria West, Cape Colony, presented by the Rev. G. H. R. Fisk, C.M.Z.S.; three European Pond Tortoises (*Emys europæa*) European, deposited; a King Snake (*Coluber getulus*) from North America, received in exchange.

OUR ASTRONOMICAL COLUMN.

THE TOTAL SOLAR ECLIPSE OF APRIL 15–16, 1893.—The following particulars of the phenomena of the total solar eclipse of April 15–16, 1893, have been supplied to the Eclipse Committee by Mr. A. M. W. Downing, Superintendent of the *Nautical Almanac* office, for the use of the English observers at the eclipse stations to be occupied in Brazil and Africa:—

Brazil. Longitude 38° 50′ W. Latitude 3° 20′ S.

		d.	h.	m.	s.	Contact from N. point.	Contact from vertical.	Sun's altitude.
Eclipse begins	April	15	22	18	14	... 136° W.	... 19° W.	... 62°
Totality begins		15	23	40	51	Duration 4m. 43·1s.		
Totality ends		15	23	45	34			
Eclipse ends		16	1	11	40	... 45° E.	... 84° W.	... 68°

Local mean times.

Senegambia. Longitude 16° 30′ W. Latitude 14° 15′ N.

		d.	h.	m.	s.	Contact from N. point.	Contact from vertical.	Sun's altitude.
Eclipse begins	April	16	1	5	3	... 130° W.	... 156° E.	... 73°
Totality begins		16	2	27	59	Duration 4m. 12·3s.		
Totality ends		16	2	32	12			
Eclipse ends		16	3	48	1	... 57° E.	... 24° W.	... 35°

Local mean times.

REMARKABLE COMETS.—Bearing this title, Mr. Lynn has written a small book, in which he gives a short survey of the most interesting facts that have occurred in the history of cometary astronomy. As he remarks in the preface, the scope of the work is almost purely historical; but we are sure there are many who will peruse these few pages with great pleasure, for the author has brought together these facts and presented them to the reader in a concise and plain style. We may mention that figures relating to elements of orbits, &c., are at a minimum, Mr. Lynn simply restricting himself to bare accounts. The author concludes by giving a list of the dates at which some of the comets may reappear, from which we make the following extract:—

Date.		Period in years.	
1893	Summer	$6\frac{1}{2}$	Finlay's Comet
1894	Winter	$3\frac{1}{3}$	Encke's ,,
1896	Spring	$7\frac{1}{2}$	Faye's ,,
,,	,,	7	Brook's ,,
1897	,,	$6\frac{1}{2}$	D'Arrest's ,,
,,	,,	$5\frac{1}{2}$	Swift's ,,
1898	Summer	$5\frac{1}{2}$	Winnecke's ,,
,,	Autumn	7	Wolf's ,,
1899	Spring	$33\frac{1}{2}$	Comet of 1866
,,	Summer	$13\frac{3}{4}$	Tuttle's Comet
,,	,,	7	Holmes's ,,

The comet of 1866, as many of our readers well know, is identical with the meteoric stream through which we pass in November, so we hope that we shall be visited by a fine display.

COMET HOLMES (1892, III.).—Comet Holmes seems to have become somewhat dimmed during the past week, but we nevertheless give the ephemeris for the benefit of those who wish to follow it a little longer.

Ephemeris for 12*h. M.T., Paris.*

1893.	R.A. app. h.	m.	s.	Decl. app. h.	m.	s.
Feb. 16	2	7	37·9	+34	14	30
17		9	15·3		16	42
18		10	53·2		18	58
19		12	31·5		21	16
20		14	10·3		23	37
21		15	49·5		26	1
22		17	29·1		28	26
23	2	19	9·2	34	30	54

COMET BROOKS (NOVEMBER 19, 1892).—This comet lies in the southernmost part of the constellation of Andromeda, just south of ε Andromedæ, and the following is the current ephemeris:—

Ephemeris for 12*h. M.T., Berlin.*

1893.	R A. app. h.	m.	s.	Decl. app. °	′	Log *r*.	Log Δ	Br.
Feb. 16	0	22	44	+26	46·9			
17		24	8	26	23·2	0·1343	0·2445	0·97
18		25	30	26	0·3			
19		26	50	25	38·3			
20		28	8	25	17·1			
21		29	23	24	56·7	0·1438	0·2711	0·83
22		30	37	24	37·1			
23	0	31	49	24	18·2			

RELATIVE POSITIONS OF STARS IN CLUSTER χ PERSEI.—Volume xxx. part iv. of the Transactions of the Royal Irish Society contains the results of the investigations of Sir Robert Ball and Mr. Arthur Rambaut, with respect to the relative positions of 223 stars in the cluster χ Persei as determined photographically. The instrument used throughout was a 15-inch silver on glass reflecting telescope, mounted according to Cook's standard equatorial pattern. For the adjustment of the plate (the size used here being $3\frac{1}{4} \times 3\frac{1}{4}$) and mirror Dr. Johnstone Stoney's collimator was employed, this method ensuring the exact perpendicularity of the photographic plate to the axis of the collimator. The negatives were measured with an instrument made by the same firm, and after the same pattern as that used by Prof. Pritchard, at Oxford, this instrument being supplied with the means of measuring either rectangular or polar coordinates, the former of which has been adopted here throughout. In this memoir the authors treat in detail, by means of figures and formulæ, the equations for orientating the plate for measurement, for computing the differences in Right Ascension and Declination from the centre of the plate, for correcting the relative apparent positions of the stars for effects of separation, observation, nutation, and procession, &c. The measures here given have been obtained from one photograph taken with an exposure of ten minutes, the images under the microscope being susceptible "of very accurate measurement." That only